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DT-10

Pegasus Settings

User's Guide

Ver 1.00

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1 Pegasus Settings for Pocket PCs

1.1 Pegasus Card Configuration for Pocket PCs

You need to configure the Pegasus card before you can be connected to the network. The Pegasus Configuration Icon  under *Start->Settings->Connections* can lead you to the configuration window. Tap on the icon will take you to the Status (or Configuration) window of the Pegasus wireless settings. Here you will see four tabs: Status, Configuration, Advanced, and About tabs. The Configuration tab may not display in Pocket PC 2003 operating system because the system has its own radio scan capability (Connection Manager), and some OEMs prefer to use the Connection Manager. The functionalities of the Status Icon will be introduced in greater detail at the end of the chapter. The Pocket PC 2003 connection manager will be described in Chapter 1.2 .

Note: "Click" in this document actually means "tap" with a stylus on the screen of the Pocket PC. However, we will keep the conventional usage of Click instead of Tap.

1.1.1 Status Tab

The status screen shows important parameters about the WLAN module as shown in Figure 1.

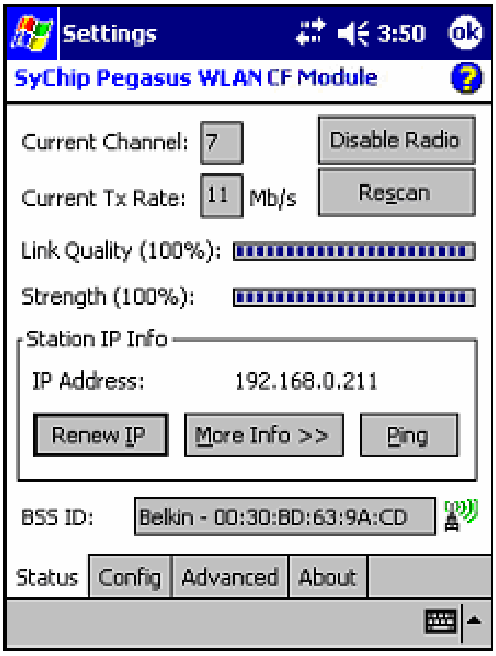


Figure 1 Status window

1.1.1. 1 Information Fields

- Current Channel

Shows the RF channel currently being used by the card.

- Current TX Rate

Shows the current transmit rate. This can be 1Mb/s, 2Mb/s, 5.5Mb/s, or 11 Mb/s.

- Link Quality

Gives signal to noise ratio in both percentage and graphical display.

- Strength

Gives signal strength of the receiver in both percentage and graphical display.

- Station IP Info
    - ❖ **IP Address** – IP address of the card or module

Note: Check with your network administrator for IP configuration information.

- BSS ID/IBSS ID

Shows the Network Name and the MAC address of the access point the card is associated with in the AP mode. Or it shows the Network Name and the MAC address of the creator of IBSS which the card is joined into in the Peer-to-Peer (Ad-Hoc) mode.

- **Help** button: open a context sensitive help window.

1.1.1. 2 Operation Buttons

- Disable/Enable Radio

Click this button in toggle to disable/enable the radio link from the card.

- Rescan

Click on this button to start a rescan process to search for an AP with stronger signal in the network.

- Renew IP

Click this button to reapply IP address from DHCP server when automatic DHCP is enabled.

- More Info

Click this button to show detailed TCP/IP info (see Figure 2):

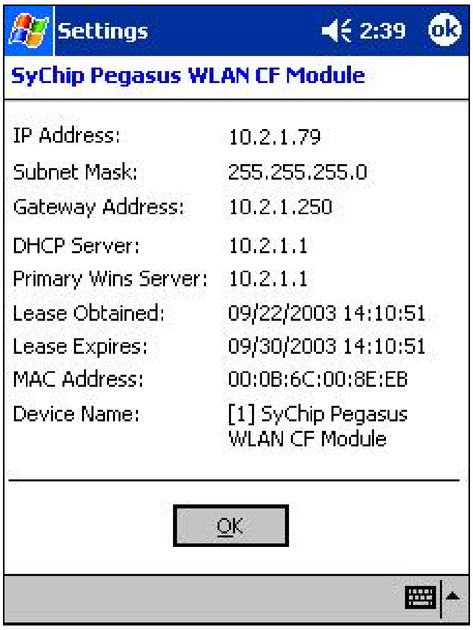


Figure 2 More Info window

Click **OK** to close this window.

- Ping

Click this button to pop up the Ping window as shown in Figure 3.

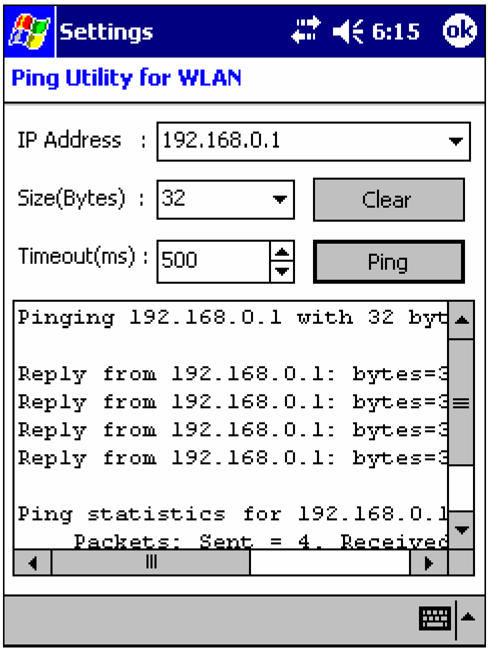


Figure 3 Ping window

- **IP Address**: Enter an IP address to ping.
- **Size (Bytes)**: Choose from pull down menu from 32 to 8192 with 32 as the default.
- **Timeout (ms)**: Defaulted to 500, can be increased or decreased from the spin button.
- **Clear**: Click this button to clear IP Address input and the ping statistics field.
- **Ping**: Click on this button to ping the IP address entered in the input field.
- **Ping Statistics Field**: Shows the pinging IP address and the pinging results.

1.1.2 Configuration Tab

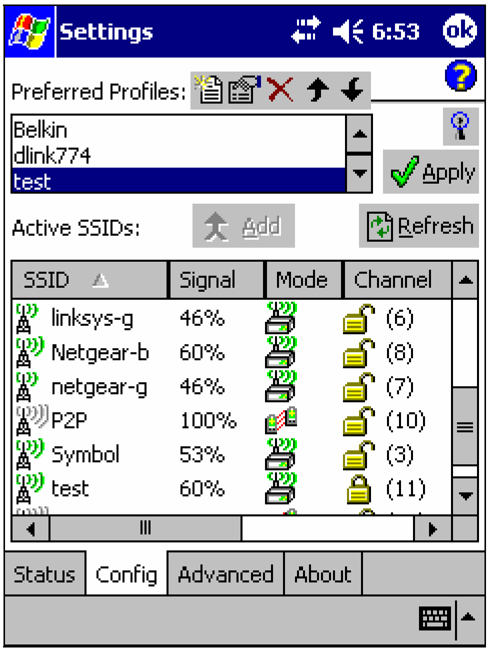


Figure 4 Configuration window

This window provides

1) Periodically updated scanning results in the Active SSIDs window that lists all the access points and peer stations available around the host.

2) A configuration tool that enables you to create and edit SSID profiles for your station to associate or join with.

1.1.2. 1 Information Fields

- Preferred Profiles

On the top of the window is a list of preferred profiles one has created, or added from the Active SSIDs table below. Whenever the radio is turned on, it will start searching for the APs to associate with in the order of the listed profiles. This table is blank after the initial Pegasus software installation. It can be kept blank with no automatic association preference. For each profile in the table, one can make changes by using icon tools on top of the table: New, Edit, Delete, Up, and Down.

Five small icon buttons on the top of the table can be used to create or modify Preferred Profiles:

 **New**: create a profile (for detailed info see Section 1.1.2. 3).

 **Edit**: modify a profile (for detailed info see Section 1.1.2. 3).

 **Delete**: delete a selected profile (for detailed info see Section 1.1.2. 4).

 **Up**: move the highlighted profile up to increase the automatic association priority.

 **Down**: move the highlighted profile down to decrease the automatic association priority.

 **WZC** button: Shortcut for Windows Zero Configuration (wireless automatic configuration), available on Pocket PC 2003 and later versions.

 **Help** button: open a context sensitive help window.

- Active SSIDs

The Active SSIDs table lists all the access points or peer stations (creator of IBSS) in the vicinity with each record displaying the following six fields (The table may not display all the fields on the screen. Use horizontal scroll bar to check all):

- ❖ **SSID** – Network Name of the access point or peer station. A link icon with signal strength is also shown.
- ❖ **Signal** – Signal Strength in percentage for that SSID.
- ❖ **Mode** – An icon shows whether it is an access point , or a peer station .
- ❖ **Channel** – The channel being used and the WEP key status. (stands for WEP Key-On, and for WEP Key-Off).
- ❖ **SupRate** – Supported data rate of the access point or the peer station.
- ❖ **BSSID (MAC Addr)** – BSSID or MAC Address of the access point or the peer station.

1.1.2. 2 Operation Buttons

- Add

Click on this button to add the selected (highlighted) profile into the Preferred Profile table. If the SSID has WEP Key On, the Settings window will pop up for you to enter the WEP Method, Encryption Key, and Key ID. Click OK button in the Settings window after finishing the configuration, and the SSID with its profile will be added into the Preferred Profiles window. No window will pop up when adding an SSID with WEP Key Off. It will be added into the Preferred Profile table directly at the click on Add button.

- Apply

Click this button to associate/join your station with the SSID you selected. This SSID can be either from the Preferred Profile or from the Active SSIDs table. When Applied, the Status tab window will display the status of the wireless connection. If the association fails, an automatic search for another AP in the preferred profile list will take place, trying to associate in the order of your preference.

- Refresh

Click this button to start a new search for all available access points or peer stations in the vicinity.

1.1.2. 3 Profile Settings Window

Tapping on the **New** or **Edit** button to enter the profile setting window. It has two tabs.

To create a new profile to the preferred list one can click the **New** button (described in Section 1.1.2. 1) without selecting (highlighting) any existing profile. An Add New Preferred SSID window will pop up as shown in Figure 5.

To modify a profile one can select (highlight) a profile and click the **Edit** button. A Modify Existing Preferred SSID window will pop up as shown in Figure 5, except that the SSID, Type, TX Rate, and Channel fields are unchangeable in AP mode, whereas TX Rate and Channel fields can be changed in Peer-to-Peer mode.

1.1.2. 3 . 1 Network Profile Tab

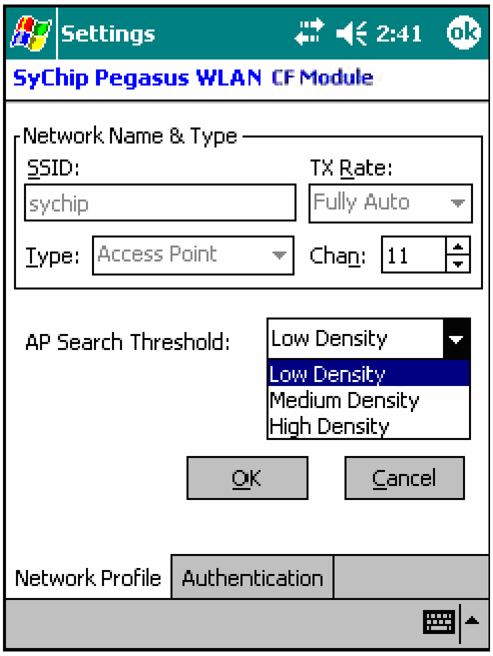


Figure 5 Network profile tab

The information fields and operation buttons are listed as follows:
Network Name & Type block: Used to create SSID with a network Type, and to configure the transmit data rate at certain channel.

- **SSID**: to enter an SSID, which is the Network Name.

Check with your network administrator for Network Name (SSID).

- **Type**: Choose from **Peer-to-Peer** or **Access Point** in the pull down menu. **Access Point** (AP) mode is also called "Infrastructure" mode. **Peer-to-Peer** (P2P) mode is used for communication between two (or more) radio stations (cards) without an access point.

- **Tx Rate**: Choose 1Mb, 2 Mb, Auto 1/2 Mb, 5.5 Mb, 11 Mb for P2P connection, or Fully Auto for AP connections from the menu. The transmit rate is Fully Automatic by default.

- **Chan**: Channel. Scroll to select a channel for communication.

- **AP Search Threshold**: Used to adjust the wireless client roaming behavior between APs.
  From the option menu choose **Low Density** (default), **Medium Density**, or **High Density,** and tap on OK button. By increasing the values from Low to High, your WLAN card tends to roams earlier from one AP to another (with the same SSID in the same network) depending on the APs' relative signal strength.

- **OK**: Click this button to make the change.

- **Cancel**: Click this button to close the window without saving or modification.

1.1.2.3.2 Authentication Tab

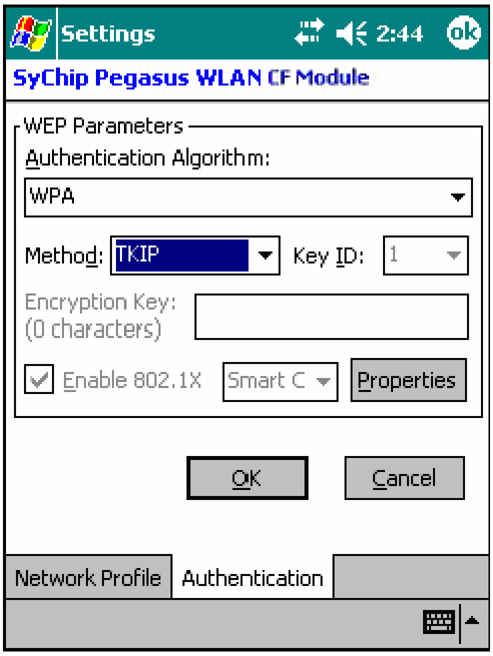


Figure 6 Authentication tab

- **Authentication Algorithm** - Five options, only configurable when WEP Method is enabled.
    1. **WECA Compliant (always use Open)** - Should match AP's setting for "Open."
    2. **Must use Shared with WEP** - Should match AP's setting for "Shared."
    3. **Automatic based on WEP setting** - Automatically matches AP's setting.
    4. **WPA-PSK** - Need Pre-Shared Key for access.
    5. **WPA**[1] - Need network certificate for authentication.
- **WEP Method** - Five options for WEP Key encryption.
    1. **Disabled** - WEP Key Off
    2. **64 bit (HEX)** - 10 characters configurable in Hexadecimal
    3. **64 bit (ASCII)** - 5 characters configurable in ASCII
    4. **128 bit (HEX)** - 26 characters configurable in Hexadecimal
    5. **128 bit (ASCII)** - 13 characters configurable in ASCII
    6. **TKIP** - Only used when WPA is selected.

NOTE: **HEX** - Hexadecimal number set of 16 digits from 0-9, and from A(a)-F(f). **ASCII** - Any printable ASCII characters.

- **Key ID** - Four options can be selected: Key 1, 2, 3, and 4. The default is Key 1.

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[1] WPA security implementation is targeted at enterprise markets only. In order to activate, a certificate enrollment program must be installed from the company's IT department in order to obtain the user's personal certificate.

- **Encryption Key** - Input character set depending on WEP method and key format.
- **Enable 802.1X** - Check the box if access to the network needs group authentication. Only configurable when WEP Method is enabled. From the pull-down menu select the 802.1X security standard, **PEAP** or **Smart Card (TLS)**. Tap on the **Properties** button to choose the certificate that applies. To access a 802.1x network you need to enroll and get the personal certificate first. Use the Certificate Enrollment program[2] in your PDA to provide the domain name, server name, user name and password required by the authentication server. This security feature is available on Pocket PC 2003.
- **OK** - Tap on this button to make the change.
- **Cancel** - Tap on this button to close the window without saving or modification.

1.1.2.4 Delete Preferred List Window

A profile can be deleted either from the Preferred List or from the Preferred List and the Registry altogether. First select (highlight) the profile you want to delete in the Preferred Profile table, then click on the Delete button (described in Section 1.1.2. 1) to pop up the Delete Options window as shown in Figure 7. From the pop-up window select the option of your choice and click **Yes** button to confirm, or **No** button to cancel.

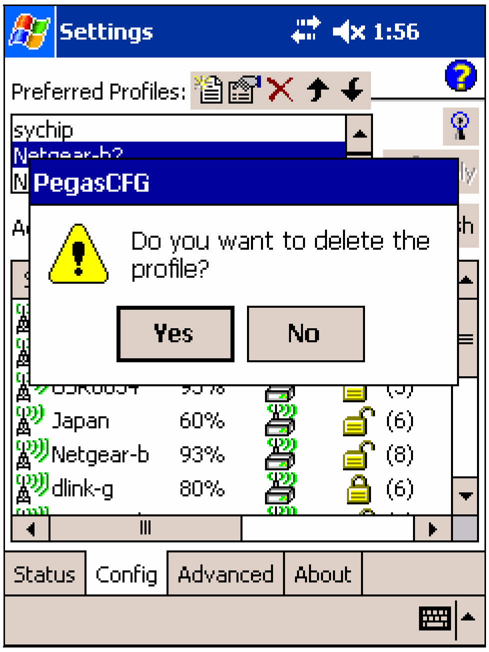


Figure 7 Delete Preferred List Options Window

1.1.3 Advanced Settings Tab

[2] See above.

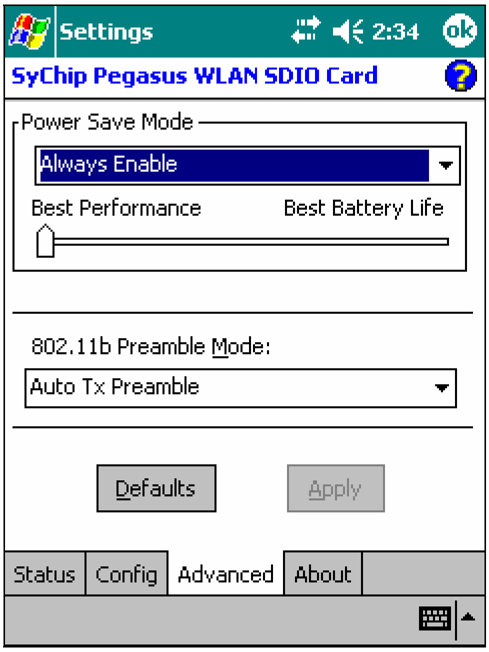


Figure 8 Advanced Settings Window

1.1.3. 1 Information Field

- Power Save Mode
  - ❖ Disable – Choosing this option will disable the power save mode.
  - ❖ Always Enable – Choosing this option will have the power save mode always enabled. This is the default setting.
  - ❖ Auto Enable – When internal battery is being used it will be in Power Save mode; when external power supply is being used the Power Save mode will be disabled automatically.
- Preamble Mode
  - ❖ Long TX Preamble – Where Sync field consists of 128 bits.
  - ❖ Short TX Preamble – Where Sync field consists of 56 bits.
  - ❖ Auto TX Preamble – Automatically change between long and short preamble mode transmission based on the AP configurations. This is the default Preamble Mode.

  Note: A Preamble consists of a Synchronization (Sync) field and a 16-bit Start Frame Delimiter (SFD) field.

-  Help button

  Open a context sensitive help window.

1.1.3. 2 Operations

- Sliding bar

The leftmost position on the sliding bar (*Best Performance*) indicates that the WLAN station will listen to every beacon from the associated AP. The default beacon interval is 100 ms for most APs. When the knob is dragged to the right-hand-side, the station will listen to the beacon in multiple beacon intervals depending on the position on the slide bar. The rightmost position (Best Battery Life) indicates the beacon interval is 10 times of AP's beacon interval, i.e. 1000 ms when the beacon interval is set to 100ms. For the Sliding bar to take effect, the *Power Save Mode* needs to be either *Always Enable* or *Auto Enable*, and you need to click on the *Apply* button.

- **Defaults Button**

Reset all the settings to default values (**Always Enable** for Power Save Mode, **Automatic based on WEP setting** for Authentication Algorithm, and **Auto TX Preamble** for Preamble Mode).

- **Apply Button**

Apply the change to new card setting.

1.1.4 About Tab

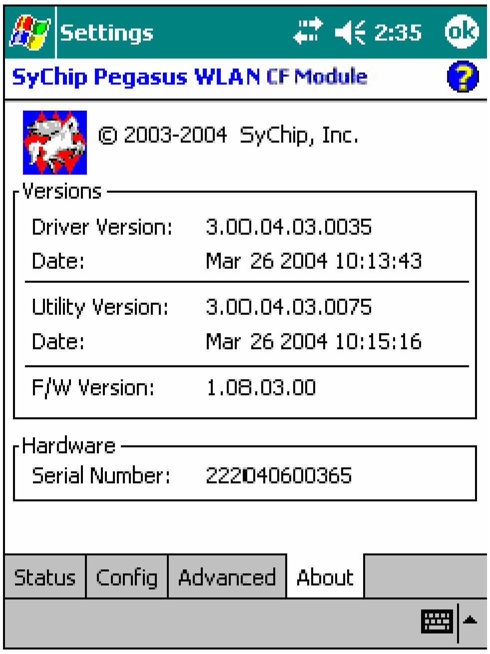


Figure 9 About Window

This window provides Version Number and time of build for Network Driver, Configuration Utility, and NIC Firmware, and the module Serial Number.

1.2 Network Setup using connection manager in PPC 2003

The connections manager plays a generic role for managing various network connections. For WLAN access, Pegasus configuration described before for Pocket PC 2002 (Section 1.1) still works. A second way of configuration is also available using the default Pocket PC 2003 connection manager (Wireless Zero Configuration or WZC).

1.2.1 Automatic network detection

- The PPC 2003 connection manager scans for wireless networks periodically. When it detects any network and it has not connected to any network yet, it will first try to connect to one of the preferred networks. If such a network is not available or the connection manager can not connect to any preferred network due to invalid WEP key, it will popup a window and shows a list of networks for you to choose. See Figure 10. If you don't see the network of your choice, click on *Settings* to get to the detailed configuration window (Figure 14).

  Note: If the connection manager is able to connect to a network automatically, the Network Detection Window (Figure 10) will not appear, and you can follow the steps described in Section 1.2.2 to access the connection manager.

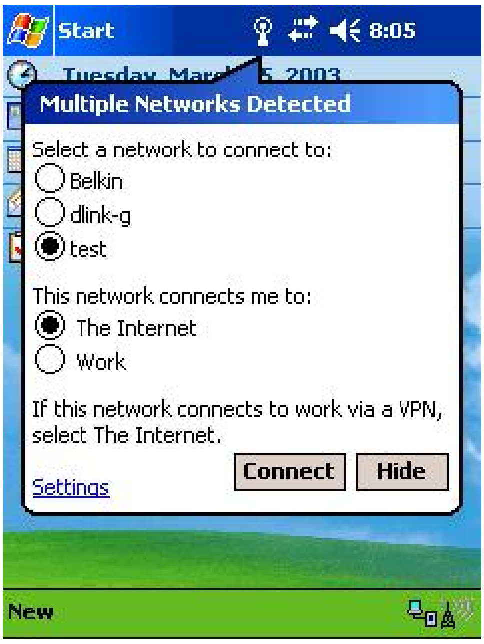


Figure 10 Network Detection

- Select your network and what the network will connect to. In most cases, you should select *The Internet.* If you are connecting to work network, select *Work.* If you do not wish to use the connection manager and would like to use the Pegasus Configuration GUI (Section 1.1) instead, click on *Hide*.

- Now click on *Connect.* If WEP is disabled, then the connection should be established, otherwise, a window will popup for you to enter the WEP key. Enter the WEP key then click on *Connect*. See Figure 11. The connection should be established.

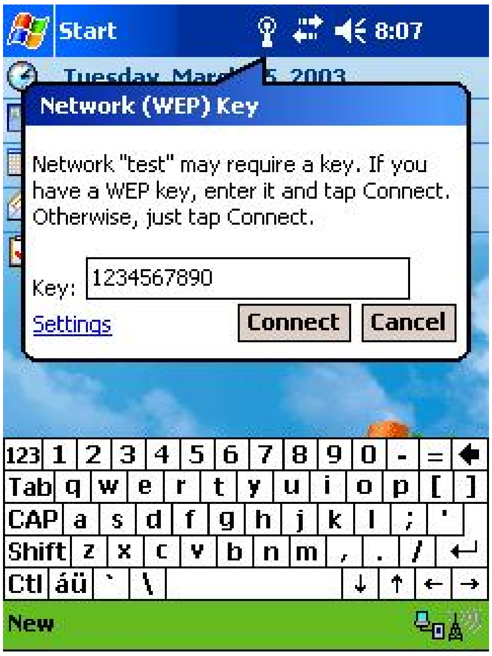


Figure 11 WEP key entry

1.2.2 Accessing the connection manager

Click on the Connectivity icon to bring up the connection manager. See Figure 12.



Figure 12 Connectivity Settings

1.2.3 Advanced Connections

Click on *Settings* link, and select *Advanced tab*. You will see the following screen. Alternatively, you can follow *Start->Settings->Connections->Connections icon ->Advanced Tab* to get to the same screen.

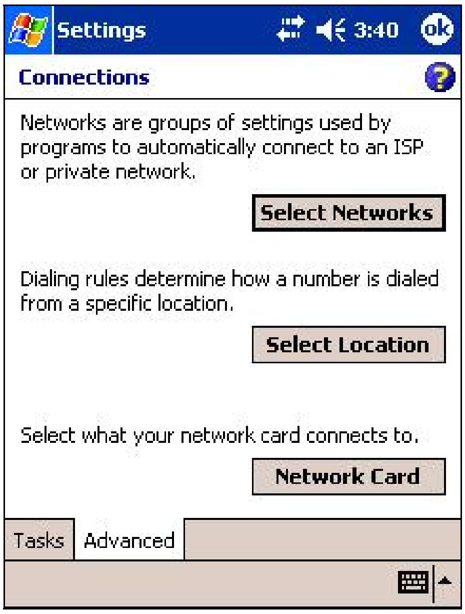


Figure 13 Advanced Connections Window

1.2.4 Network Card

Click on *Network Card* button and select *Wireless* tab. Make sure "*All Available*" or "Only access points" is selected under *Networks to access.* A list of Access Points and their connectivity/availability status will appear on the screen shown in Figure 14.

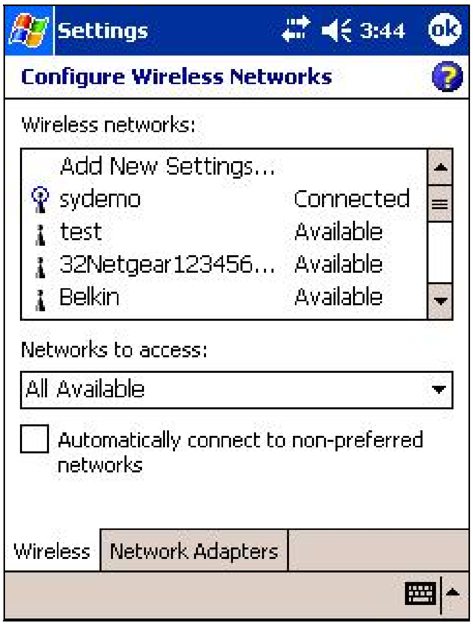


Figure 14 Configure Wireless Networks

1.2.5 WEP Key Entry

Click on the AP you want to connect to, a configuration screen will appear. Then select the *Authentication* tab. See Figure 15.

If WEP is enabled on the AP, check the first checkbox, which is "*Data encryption (WEP Enabled)*". Now you need to obtain the WEP key and key index from your network administer, put the key string in the textbox labeled "*Network key*", and select the *Key index* from the choice box (the default key index is 1). If WEP is not enabled, then leave the "*Data encryption*" unchecked. Click on OK to return to the previous screen (Figure 14).

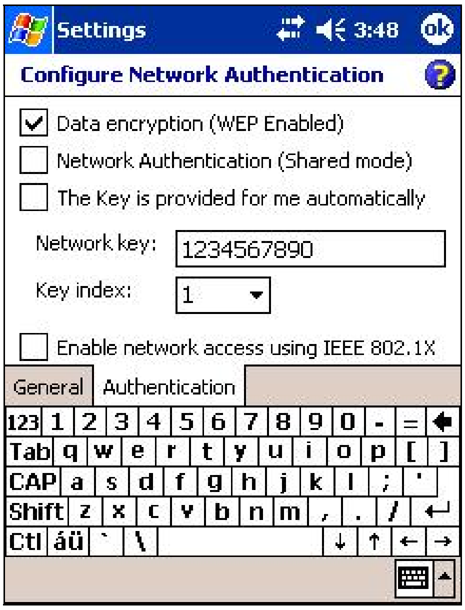


Figure 15 Configure Network Authentication

1.2.6 Connecting to an AP

Tap and hold on the AP entry you wish to connect to, and select *Connect* option on the popup menu as shown in Figure 16. The LED on the WLAN module should start to blink, indicating it is trying to associate, and eventually turn green, which means it is connected successfully. The screen will also be updated to show the

new connection. See Figure 17.

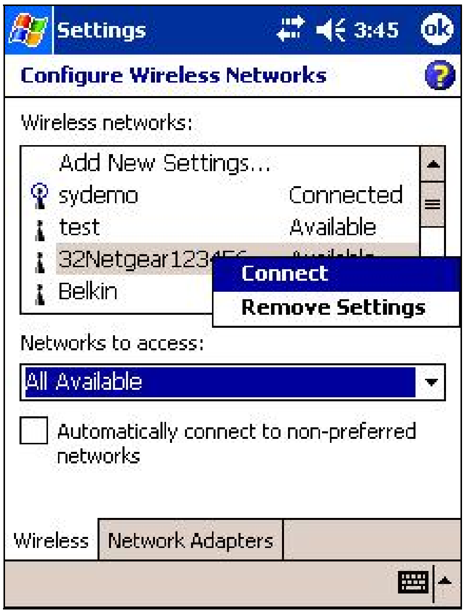


Figure 16 Connecting to an AP

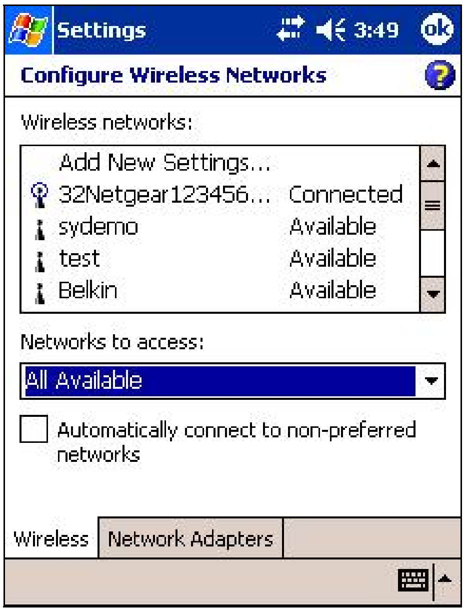


Figure 17 Connection to a new AP

1.2.7 Verifying network connectivity

If the Pocket PC is not connected with a host PC via a sync cable, then the Connectivity icon normally indicates the WLAN connection is properly established. You can also check on the *Network Adapters* tab to check if the IP address obtained from DHCP is correct. See Figure 18, click "SyChip Pegasus WLAN CF Module" to see the IP address information (Figure 19).

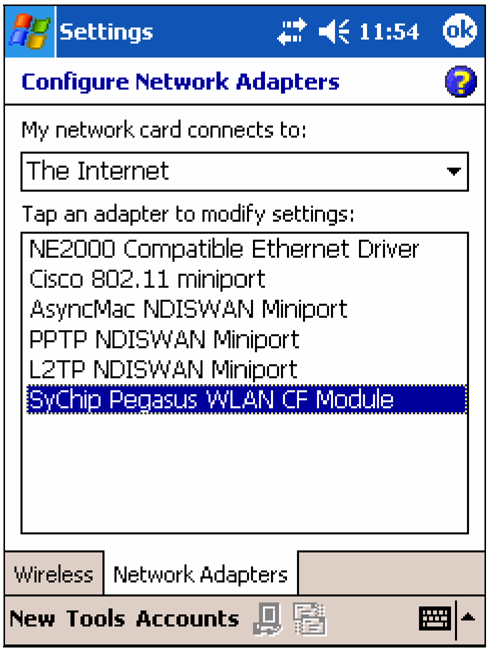


Figure 18 Network adapter status

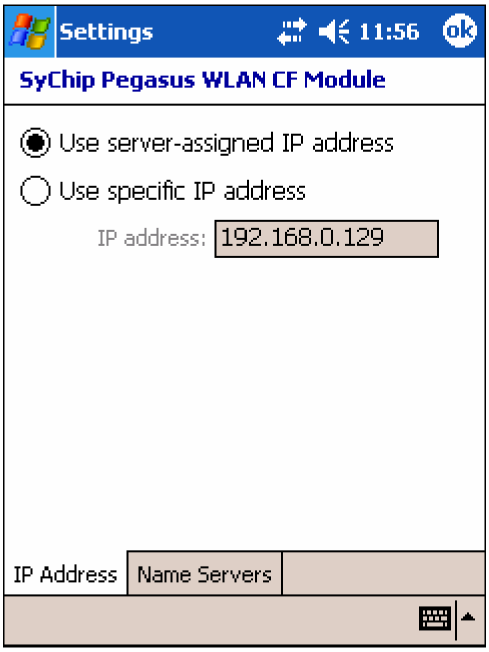


Figure 19 IP address

1.2.8 Peer-to-peer mode

Peer-to-peer mode is also known as the "Ad-Hoc" mode. There are two ways for your device to connect to other devices in peer-to-peer mode. The first way is that you create an Ad-Hoc network on your device, and then allow other devices to connect to yours by joining the network. The second way is simply connect your device to an existing Ad-Hoc network, if such network is already created by the peer device.

1.2.8. 1 Creating an Ad-Hoc network from your device

1. Get to the *Configure Wireless Networks* screen as shown in Figure 14. Change the *Networks to access* choice box to *Only computer-to-computer*. Select *Add New Settings…* under *Wireless networks*. See Figure 20.

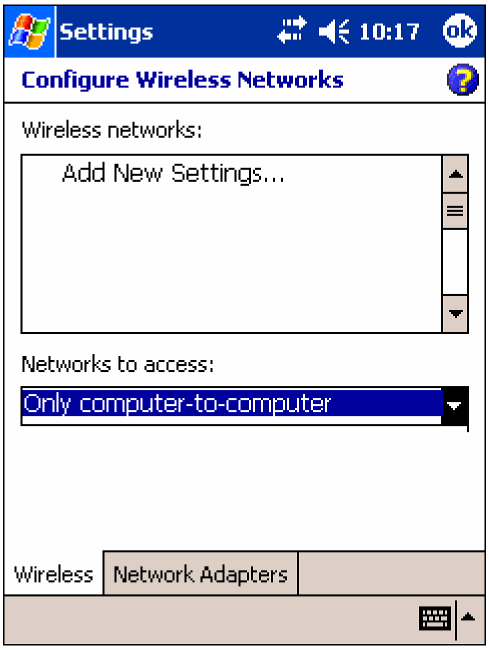


Figure 20 Configuring an Ad-Hoc network

2. Type in the network name in the *Network Name* field (*txtest,* for example). Then check the box *This is a device-to-computer (Ad-Hoc) connection.*

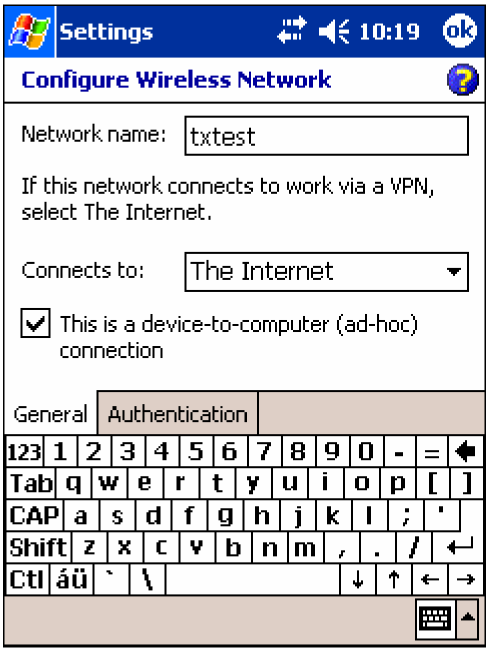


Figure 21 Creating a new Ad-Hoc network

3. OK to go back to the previous screen. Click and hold the network name and select *connect*.

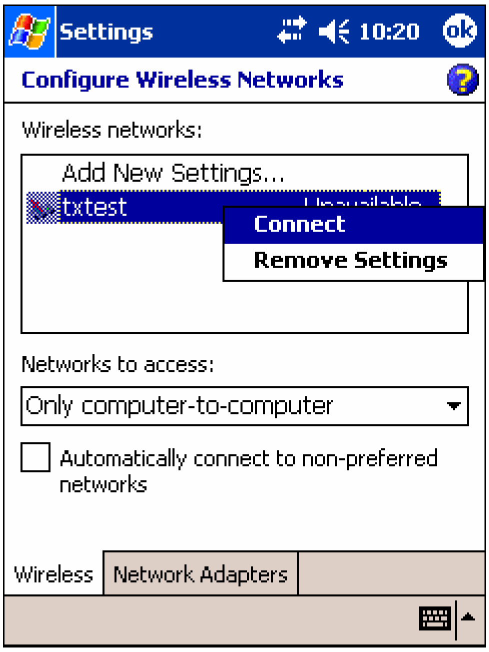


Figure 22 Connecting to the Ad-Hoc network

4. Now the new Ad-Hoc network has been created, and it is visible to other WLAN devices. Your device is connected to the Ad-Hoc network as shown in Figure 23.

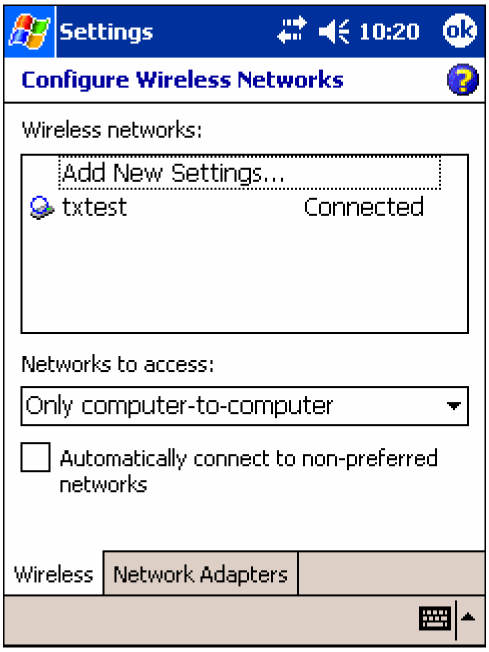


Figure 23 Connected to the Ad-Hoc network

1.2.8. 2 Connecting other devices to the Ad-Hoc network

Once the Ad-Hoc network is created, it is available for other devices to join. To join the network, go to the *Configure Wireless Networks* screen (Figure 22) using a second device. Repeat step 3 (Figure 22) and step 4 (Figure 23), the second device should now be connected to the newly created Ad-Hoc network, e.g. *txtest*. You can go to the connection *Status* screen (Figure 1) to find the devices' IPs. The two devices on the same Ad-Hoc network should be able to ping each other. You can add more devices to the Ad-Hoc network by performing the same procedure so that they form a closed network among themselves.

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